

PATENT COOPERATION TREATY

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From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:

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UNITED STATES OF AMERICA

Due Date: 11/6/03Statutory Deadline: 11/3/03Date Docketed: mmDocketed by: mmSec: mmAtty: mm

INVITATION TO PAY ADDITIONAL FEES

(PCT Article 17(3)(a) and Rule 40.1)

Date of mailing

(day/month/year)

22/09/2003 mm

Applicant's or agent's file reference

13743.104WO

PAYMENT DUE

within 45 ~~xxx~~ days
from the above date of mailing

International application No.

PCT/US 03/ 13125

International filing date
(day/month/year)

28/04/2003

Applicant

THE REGENTS OF THE UNIVERSITY OF COLORADO...

1. This International Searching Authority

- (i) considers that there are 2 (number of) inventions claimed in the international application covered by the claims indicated ~~below~~ on the extra sheet:

and it considers that the international application does not comply with the requirements of unity of invention (Rules 13.1, 13.2 and 13.3) for the reasons indicated ~~below~~ on the extra sheet:

- (ii) ☒ has carried out a partial international search (see Annex) ☐ will establish the international search report on those parts of the international application which relate to the invention first mentioned in claims Nos.:

1-6, 20-31

- (iii) will establish the international search report on the other parts of the international application only if, and to the extent to which, additional fees are paid

2. The applicant is hereby invited, within the time limit indicated above, to pay the amount indicated below:

EUR 945,00 x 1 = EUR 945,00
Fee per additional invention number of additional inventions total amount of additional fees

Or, _____ x _____ = _____

The applicant is informed that, according to Rule 40.2(c), the payment of any additional fee may be made under protest, i.e., a reasoned statement to the effect that the international application complies with the requirement of unity of invention or that the amount of the required additional fee is excessive.

3. ☒ Claim(s) Nos. See Annex have been found to be unsearchable under Article 17(2)(b) because of defects under Article 17(2)(a) and therefore have not been included with any invention.

Name and mailing address of the International Searching Authority



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Loredana Cipolla

1. The present communication is an Annex to the invitation to pay additional fees (Form PCT/ISA/206). It shows the results of the international search established on the parts of the international application which relate to the invention first mentioned in claims Nos.:
- 1-6, 20-31
2. This communication is not the international search report which will be established according to Article 18 and Rule 43.
3. If the applicant does not pay any additional search fees, the information appearing in this communication will be considered as the result of the international search and will be included as such in the international search report.
4. If the applicant pays additional fees, the international search report will contain both the information appearing in this communication and the results of the international search on other parts of the international application for which such fees will have been paid.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	RIEDEL R ET AL: "SINTERING OF AMORPHOUS POLYMER-DERIVED SI, N AND C CONTAINING COMPOSITE POWDERS" JOURNAL OF THE EUROPEAN CERAMIC SOCIETY, ELSEVIER SCIENCE PUBLISHERS, BARKING, ESSEX, GB, vol. 5, no. 2, 1989, pages 113-122, XP000081838 ISSN: 0955-2219	1-6
A	page 114, right-hand column, paragraph 2 - paragraph 4 page 119, right-hand column, paragraph 2	20-31
X	JULIN WAN ET AL: "Nano-nano composites of silicon nitride and silicon carbide" ULTRAFINE GRAINED MATERIALS II. PROCEEDINGS. TMS ANNUAL MEETING, ULTRAFINE GRAINED MATERIALS II. PROCEEDINGS OF A SYMPOSIUM. 2002 TMS ANNUAL MEETING, SEATTLE, WA, USA, 17-21 FEB. 2002, pages 235-244, XP008021054 2002, Warrendale, PA, USA, TMS-Miner. Metals & Mater. Soc, USA ISBN: 0-87339-523-9 page 237, paragraph 3 page 238, paragraph 3; figure 5 page 241, paragraph 5 -page 242, paragraph 1	1,3

☒ Further documents are listed in the continuation of box C.

☐ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>GIAN DOMENICO SORARU ET AL: "POLYMER-DERIVED SI₃N₄-ZrO₂ NANOCOMPOSITE POWDERS" JOURNAL OF MATERIALS RESEARCH, NEW YORK, NY, US, vol. 7, no. 5, May 1992 (1992-05), pages 1266-1270, XP008021101 ISSN: 0884-2914 page 1266, left-hand column, paragraph 3 -page 1266, column 2, paragraph 2 page 1267, left-hand column, paragraph 2 -right-hand column, paragraph 1 page 1268, left-hand column, paragraph 1 -right-hand column, paragraph 1 -----</p>	1,3

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-6,20-31

A ceramic nano-composite, comprising a substantially amorphous matrix of non-oxide ceramic phase, wherein the non-oxide ceramic phase is composed primarily of the elements silicon, carbon and nitrogen, and a nano-scale dispersion of crystalline oxide phases in said substantially amorphous matrix (claims 1-6) and a method of making such a ceramic nano-composite, wherein the crystalline oxide phase is a ferrite and the resulting ceramic nano-composite is a magnet (claims 20-31). The method of making the ceramic nano-composite includes mixing the oxide powder with a precursor of the silicon carbonitride, cross linking, powdering and pelletizing steps, and finally pyrolysing to form the nanocomposite (claims 20-31)

2. Claims: 7-19,32-41

A nano-composite ceramic, comprising a non-oxide ceramic phase, wherein the non-oxide ceramic phase is composed primarily of the elements silicon, carbon and nitrogen, and a nano-phase distribution of an oxide ceramic within said non-oxide matrix and a method of making such a ceramic nano-composite. This ceramic can be a fiber (claims 7-19), a ceramic having a predetermined coefficient of thermal expansion (claims 32-37) or a ceramic coated structure, wherein the oxide ceramic is crystalline and the coating has a coefficient of thermal expansion that matches the coefficient of thermal expansion of the substrate (claims 38-41). The methods for making the nanocomposite fiber (claims 7-13) and the ceramic having a predetermined coefficient of thermal expansion (claims 32-37) include the steps of providing a primary precursor of the non-oxide ceramic and a secondary precursor of the oxide ceramic, mixing them, thermosetting the mixture and pyrolysing to form the nanocomposite.

The common concept linking the products of claims 1-6 & 20-31 with the products of claims 7-19 & 32-41, is the following:

A ceramic nano-composite, containing a nano-scale dispersion of an oxide phase in a non-oxide phase, the non-oxide phase being composed primarily of the elements silicon, carbon and nitrogen and the oxide phase possibly being crystalline.

The methods of claims 20-31 and claims 7-13 & 32-37 furthermore have the following features in common: the mixing of an oxide or oxide precursor with a silicon carbonitride precursor and pyrolysing to obtain the nanocomposite.

Document XP000081838 discloses the common concept and all linking features between these two groups of claims (page 119, last paragraph and page 114, right column, paragraphs 2-4)

Thus, the two aforementioned groups of claims (claims 1-6 & 20-31 and 7-19 & 32-41) are not so linked as to form a single general inventive concept (Rule 13.1 PCT) and therefore lack unity a posteriori.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 206

Continuation of Box 3.

Present claims 1, 7, 14, 20, 32 and 38 relate to an extremely large number of possible compounds. Support within the meaning of Article 6 PCT and disclosure within the meaning of Article 5 PCT is to be found, however, for only a very small proportion of the compounds claimed. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely those parts relating to the compounds in which the non-oxide ceramic phase is composed primarily of the elements silicon, carbon and nitrogen.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.